UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/691,461 | 10/22/2003 | Toshihiro Suzuki | 1324.68565 | 7326 |

24978 7590 07/09/2008

GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606

| EXAMINER | |
|---|---|
| BODDIE, WILLIAM | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2629 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 07/09/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/691,461 | SUZUKI ET AL. | |
| | Examiner | Art Unit | |
| | WILLIAM L. BODDIE | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *3-7,9,10 and 12-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *3-7,9,10 and 12-19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. In an amendment dated, April 9th, 2008, the Applicant traversed the rejection of claims 3-7, 9-10 and 12-19. Currently claims 3-7, 9-10 and 12-19 are pending.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 3-7, 9-10 and 12-19 have been considered but are not persuasive.

3. On page 8 of the Remarks, the Applicants argue that Nakabayashi does not disclose a curved light reflecting surface.

4. The Examiner must respectfully disagree. While Nakabayashi does label section 243 as "flat portions" this does mean that none of the light reflecting surface of fig. 23c is curved. Specifically, the middle of the light guide plate seems to be quite clearly curved from the drawings. Furthermore the Applicants are further pointed to figure 18 of Nakabayashi which even more clearly demonstrates a curved light reflecting surface. As such at best figure 23c discloses at least a portion of a curved light reflecting surface; at worst the completely curved figure 18 light guide can be joined in similar fashion to that shown in figure 23c. Regardless Nakabayashi does disclose a curved light reflecting surface opposite a light exit surface.

5. On page 9 of the Remarks, the Applicants argue that one of ordinary skill in the art would not have combined Nakabayashi with Umemoto as doing so would destroy the Nakabayashi reference. The Examiner must respectfully disagree.

6. As the irregularities are defined by Umemoto as "fine" there would appear to be only minimal disruption of the light direction of the Nakabayashi device. Furthermore

while angles of the slopes of Nakabayashi's guide plate are important there is a large range of angles that are acceptable as disclosed for example in column 21 lines 12-33. Nakabayashi discloses angle ranges for example of less than or equal to 49.8 degrees. Therefore it does appear that some error in the angle of the slopes is allowable for the light guide plate of Nakabayashi to still function. One of ordinary skill in the art, in an effort to decrease moire, would thus be able to incorporate the fine irregularities of Umemoto with minimal disruption of the Nakabayashi light guide plate.

7. On pages 10-11 of the Remarks, the Applicants restate the above addressed arguments for claims 9-10 and 12-19. As shown above these rejections are seen as proper and sufficient and are thus maintained.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409).

**With respect to claim 3,** Nakabayashi discloses, a light source device comprising:

first (212 in fig. 23c) and second (211 in fig. 23c) light sources which emit light; and

a light guide plate having a planar light exit surface (321-322 in fig. 23c), a curved (curved surface of fig. 23c; also note that the grooves (204) are extremely shallow ~5m deep; col. 19, line 13) light reflecting surface opposite said light exit surface (311-312 in fig. 23c), a first light-emitting region (322 in fig. 23c) which is provided in an area other than the neighborhood of the first light source and which has a first lighting element (204 in fig. 23c) provided on said light reflecting surface (312 in fig. 23c) for taking out, through said light exit surface (322 in fig. 23c), light guided from the side of the first light source, and a second light-emitting region (321 in fig. 23c) which is provided in an area other than the neighborhood of the second light source and which has a second lighting element (204 in fig. 23c) provided on said light reflecting surface (311 in fig. 23c) for taking out, through said light exit surface (321 in fig. 23c), light guided from the side of the second light source (col. 22, lines 21-37; discloses, that the top plate 311-312 reflects the light to be output at the bottom faces 321-322);

Nakabayashi does not expressly disclose wherein the first and second light elements comprise fine irregularities evenly formed on the curved light reflecting surface of the light guide plate.

Umemoto discloses, a light guide plate (11 in fig. 4) wherein a light element (angled protrusions in fig. 4) comprises fine irregularities evenly formed (col. 8, lines 48-61) on a light-reflecting surface (col. 8, lines 47-49) of a light guide plate (11 in fig. 4).

Umemoto and Nakabayashi are analogous art because they are both from the same field of endeavor namely, design of light guide plates.

At the time of the invention it would have been obvious to one of ordinary skill in the art to augment the prism-like elements of Nakabayashi with the fine irregularity light scattering elements of Umemoto.

The motivation for doing so would have been to prevent lowering of display quality due to moire (Umemoto; col. 8, lines 46-47).

**With respect to claim 4,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Nakabayashi further discloses, wherein the light guide plate has light-reflecting elements (2 in fig. 23c; col. 22, line 36) for reflecting light on end faces thereof which are opposite to the first and second light sources, respectively.

**With respect to claim 5,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Nakabayashi further discloses, wherein each of the first and second light sources is a plurality of point light sources (col. 22, lines 32-34) which are provided side by side (col. 35, lines 24-26).

**With respect to claim 6,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Nakabayashi further discloses, wherein the first light source is provided near the second light-emitting region and wherein the second light source is provided near the first light-emitting region (clear from fig. 23c).

**With respect to claim 7,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Nakabayashi further discloses, a first light guide region (left 203 in fig. 23c) for guiding light from the side of the first light source (212 in fig. 23c) to the first light-emitting region (322 in fig. 23c); and

a second light guide region (right 203 in fig. 23c) for guiding light from the side of the second light source (211 in fig. 23c) to the second light-emitting region (321 in fig. 23c);

wherein the first and second light guide regions are provided in the single light guide plate (clear from fig. 23c that the light guide plate is a single plate).

10. Claims 9 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409) in view of Miura et al. (US 6,693,619).

**With respect to claim 9,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Neither Umemoto nor Nakabayashi expressly disclose, at what frequencies the light sources are energized.

Miura discloses, a light source driving circuit (12, 15 in fig. 6) for causing first (107 in fig. 7) and second (108 in fig. 7) light sources to emit light at a predetermined flashing frequency at predetermined timing which is different between the light sources (fig. 8; col. 4, lines 49-67).

Nakabayashi, Umemoto and Miura are analogous art because they are from the same field of endeavor namely, light source devices for display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to drive the light sources of Nakabayashi and Umemoto with the different frequencies that are taught by Miura.

The motivation for doing so would have been to eliminate trailing (Miura; col. 5, lines 10-12).

**With respect to claim 13,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Nakabayashi further discloses, the use in liquid crystal displays (col. 1, lines 7-11).

Neither Nakabayashi nor Umemoto expressly disclose, a display.

Miura discloses, a display panel having a display area including a plurality of pixels (4a in fig. 2);

a driving circuit for supplying a predetermined drive signal to the display panel (11 in fig. 6); and

a light source device for illuminating the display panel (105 in fig. 6).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the display taught by Miura around the light source device of Nakabayashi and Umemoto.

The motivation for doing so would have been to provide brighter images (Miura; col. 1, lines 22-24).

**With respect to claim 14,** Nakabayashi, Umemoto and Miura disclose, a display according to claim 13 (see above).

Miura further discloses, wherein the display panel is a liquid crystal display panel (4 in fig. 1) having a pair of substrates and a liquid crystal sealed between the pair of substrates (col. 1, lines 13-21).

**With respect to claim 15,** Nakabayashi, Umemoto and Miura disclose, a display according to claim 13 (see above).

Nakabayashi and Umemoto fail to disclose that the first and second light emitting regions are arranged in a direction in which the display area is scanned.

Miura further discloses, first and second light-emitting regions are arranged in a direction in which the display area is scanned (fig. 8; note the captions).

It would have been obvious to orient the light guide of Nakabayashi and Umemoto as taught by Miura for the benefit of improving picture quality (Miura; col. 5, lines 9-11).

**With respect to claim 16,** Nakabayashi, Umemoto and Miura disclose, a display according to claim 13 (see above).

Neither Nakabayashi nor Umemoto expressly disclose, a flashing frequency for alternately driving the first and second light source of the light source device that is equal to a frame frequency of the display panel.

Miura discloses, wherein a flashing frequency for alternatively driving the first and second light source of the light source device (clear from fig. 8, that the light sources are alternated) is equal to a frame frequency of the display panel (col. 5, lines 13-17).

Nakabayashi, Umemoto and Miura are analogous art because they are from the same field of endeavor namely, light source devices for display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to drive the light sources of Nakabayashi and Umemoto with the different frequencies that are taught by Miura.

The motivation for doing so would have been to eliminate trailing (Miura; col. 5, lines 10-12).

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409) in view of Koike et al. (US 5,659,410).

**With respect to claim 10,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Neither Nakabayashi nor Umemoto expressly disclose, wherein the first and second light-emitting regions are divided into respective plural parts, which are alternately arranged.

Koike discloses, first (6a/b in fig. 11a) and second (6/a/b in fig. 11a) light emitting regions that are divided into respective plural parts, which are alternately arranged (note the identical shape of the light guide 1, to the applicant's embodiment seen in fig. 19).

Koike, Umemoto and Nakabayashi are analogous art because they are all from the same field of endeavor namely, design of light guide plates.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the single wedge-like shape of Nakabayashi and Umemoto with the multiple inclination guide taught by Koike.

The motivation for doing so would have been to suppress the reflective appearance and obtain a uniform brightness across the panel (Koike; col. 5, lines 52-57).

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409) in view of Yamada et al. (US 5,704,703).

**With respect to claim 12,** Nakabayashi and Umemoto disclose, a light source device according to claim 3 (see above).

Neither Umemoto nor Nakabayashi expressly disclose, arranging a plurality of light guide plates such that they are optically independent of each other.

Yamada discloses, wherein a plurality of light guide plates (72 in fig. 15) are provided such that they are optically independent of each other (col. 13, lines 17-44).

Nakabayashi, Umemoto and Yamada are analogous art because they are from the same field of endeavor namely, light source devices for display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to arrange the planar light guide plates of Nakabayashi and Umemoto in such a manner so that they are optically independent as taught by Yamada.

The motivation for doing so would have been even luminance, sharp directivity and high efficiency (Yamada; col. 13, lines 47-50) .

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409) in view of Miura et al. (US 6,693,619) further in view of Takemoto (US 6,417,833).

**With respect to claim 17,** Nakabayashi, Umemoto and Miura disclose, a display according to claim 16 (see above).

Miura further discloses, causing the first and second light sources to flash at the flashing frequency (clear from fig. 8), and by turning on the first and second light sources to emit light at timing which is set based on a predetermined phase difference of the drive signal to the display panel (see fig. 8, where while 4a is being scanned the light source for 4b is on; after a predetermined phase difference (after 4a has been updated) the light source of 4a is turned on; this process alternates within each frame).

Neither Nakabayashi, Umemoto nor Miura disclose, wherein the driving circuit performs multi-scan.

Takemoto discloses, a driving circuit performs multi-scan (col. 1, lines 57-67; col. 4, lines 18-44).

Nakabayashi, Miura, Umemoto and Takemoto are all analogous art because they are all from the same field of endeavor namely light source devices for display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the driving circuit of Nakabayashi, Umemoto, and Miura with the driving circuit performing multi-scanning as taught by Takemoto.

The motivation for doing so would have been to improve the display quality by eliminating the ripple phenomenon (Takemoto; col. 2, lines 30-34).

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Kashima et al. (US 5,735,590).

**With respect to claim 18,** Nakabayashi discloses, a light source device (fig. 23c) comprising:

first and second light sources which emit light (212 and 211 in fig. 23c); and

a light guide plate having a curved light exit surface (321, 322 in fig. 23c), a light reflecting surface opposite said light exit surface (311, 312 in fig. 23c),

a first light-emitting region (322 in fig. 23c) which is provided in an area other than the neighborhood of the first light source (clear from fig. 23c) and which has a first lighting element (right sided prisms) provided on said light reflecting surface for taking out, through said light exit surface, light guided from the side of the first light source, and

a second light-emitting region (321 in fig. 23c) which is provided in an area other than the neighborhood of the second light source (clear from fig. 23c) and which has a second lighting element (left sided prisms in fig. 23c) provided on said light reflecting surface for taking out, through said light exit surface, light guided from the side of the second light source (col. 22, lines 21-37);

wherein the first and second lighting elements include a light-scattering layer (204 in fig. 23c) on the light reflecting surface of the light guide plate.

Nakabayashi does not expressly disclose a screen printed light-scattering layer.

Kashima discloses, a light source device (fig. 6) comprising a light-scattering layer (6 in fig. 6; also see figs. 7-8) screen printed (col. 6, lines 2-4) on a light reflecting surface (bottom of 1 in fig. 6) of a light guide plate (1 in fig. 6).

Kashima and Nakabayashi are analogous art because they are both from the same field of endeavor namely design of light guide plates.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the screen printed light diffusing elements of Kashima on the device of Nakabayashi for the benefit of high power brightness conversion efficiency in a direction substantially perpendicular to the light exit surface (Kashima; col. 3, lines 56-67).

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Umemoto et al. (US 6,366,409) in view of Lin (US 2003/0184990).

**With respect to claim 19,** Nakabayashi discloses, a light source device (fig. 23c) comprising:

first and second light sources which emit light (212 and 211 in fig. 23c); and

a first light guide region having a planar light exit surface (322 in fig. 23c), a light reflecting surface opposite said light exit surface (311, 312 in fig. 23c), a first light-emitting region (322 in fig. 23c) which is provided in an area other than the neighborhood of the first light source (212 in fig. 23c) and which has a first lighting element (right 204 in fig. 23c) provided on said light reflecting surface for taking out, through said light exit surface, light guided from the side of the first light source (col. 22, lines 24-31); and

a second light guide region having a planar light exit surface (321 in fig. 23c), a light reflecting surface opposite said light exit surface (311 in fig. 23c), a second light-emitting region (321 in fig. 23c) which is provided in an area other than the neighborhood of the second light source (211 in fig. 23c) and which has a second lighting element (left 204 in fig. 23c) provided on said light reflecting surface for taking

out, through said light exit surface, light guided from the side of the second light source (col. 22, lines 24-31).

Nakabayashi does not expressly disclose two light guide plates stacked one on another or where the lighting elements comprise fine irregularities.

Umemoto discloses, a light guide plate (11 in fig. 4) wherein a light element (angled protrusions in fig. 4) comprises fine irregularities evenly formed (col. 8, lines 48-61) on a light-reflecting surface (col. 8, lines 47-49) of a light guide plate (11 in fig. 4).

Umemoto and Nakabayashi are analogous art because they are both from the same field of endeavor namely, design of light guide plates.

At the time of the invention it would have been obvious to one of ordinary skill in the art to augment the prism-like elements of Nakabayashi with the fine irregularity light scattering elements of Umemoto.

The motivation for doing so would have been to prevent lowering of display quality due to moire (Umemoto; col. 8, lines 46-47).

Neither Umemoto nor Nakabayashi expressly disclose two light guide plates stacked one on another.

Lin discloses, stacking light guide plates on one another (figs. 2 and 3).

Nakabayashi, Umemoto and Lin are analogous art because they are from the same field of endeavor namely, light source devices for display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to stack two of Nakabayashi and Umemoto's light guide plates as taught by Lin.

The motivation for doing so would have been increased reliability (Lin; para. 20).

***Conclusion***

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM L. BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

/William L Boddie/
Examiner, Art Unit 2629
7/1/08